

It Takes a System to Make a Save

In the HeartRescue Project's approach to improving SCA survival, everyone plays a role

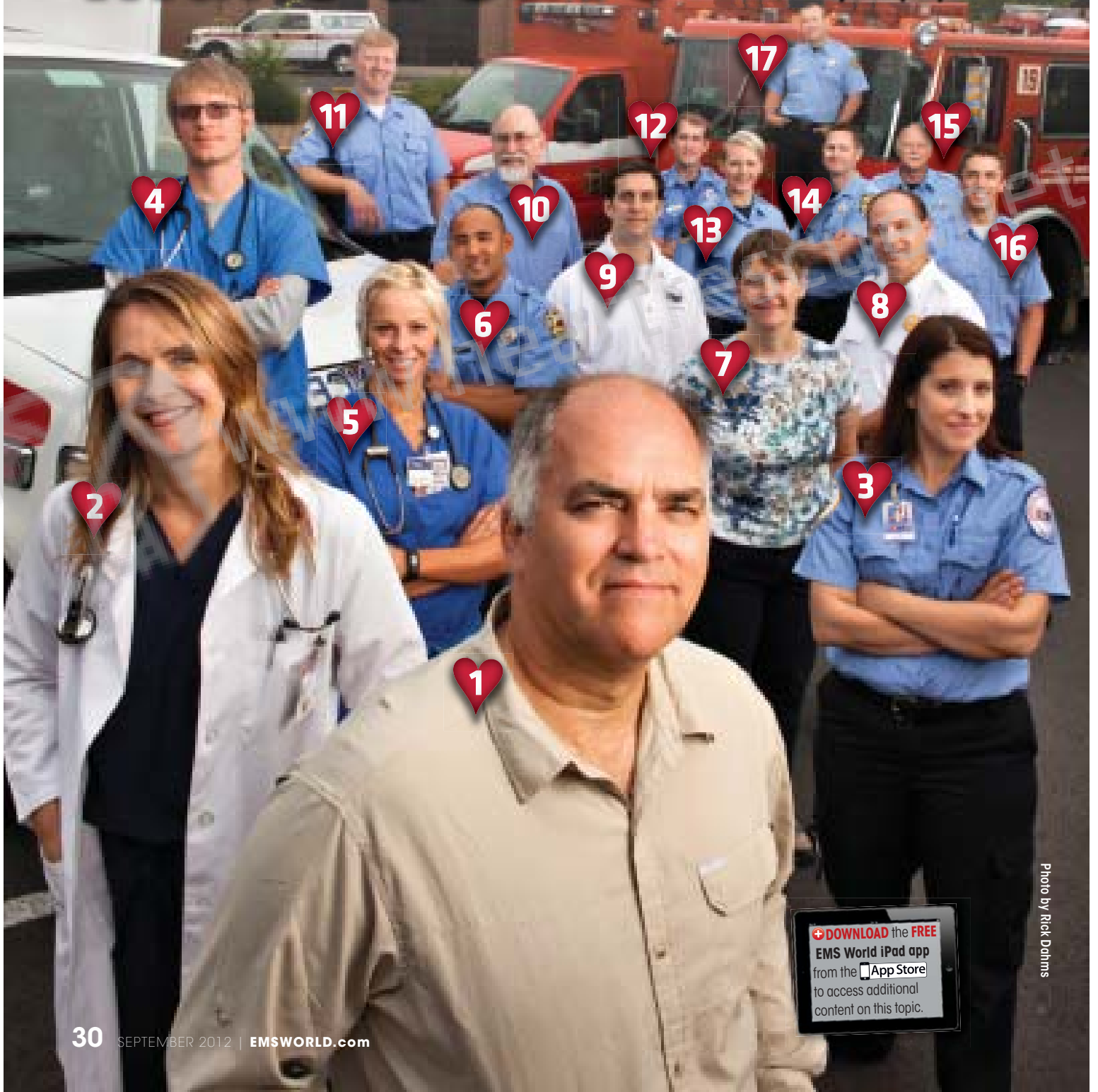


Photo by Rick Dahms

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No clinical condition has had more impact on defining the role and culture of modern EMS systems than cardiac arrest. More important, there's no clinical condition that gives us such a tremendous opportunity to dramatically improve outcomes. Today we understand so much more about the pathophysiology of cardiac arrest and the principles that maximize the patient's opportunity for a good outcome, but we haven't truly realized the potential.

Yet.

At an industry level, the approach to managing cardiac arrest has had a profound influence on EMS system design, educational program development, and staffing and deployment decisions. Recognized early and managed effectively, SCA patients have significant potential to return to normal lives. When they're not, death (or, worse, survival in a persistent neurologically vegetative state) is almost guaranteed. To the general public, cardiac arrest has always been perceived (appropriately) as "the big one." They expect us (again, appropriately) to be ready, trained, equipped and competent to care for this condition whenever and wherever it occurs. In the eyes of our communities, cardiac arrest is one of the main reasons we exist.

At home, in each of our agencies, we're regularly tasked with evaluating and implementing evolving guidelines as well as local changes in our communities. When the science of resuscitation changes, treatment protocols change, new equipment or medication may be introduced, and educational efforts that include not only didactic information but some form of practical, hands-on experience are rolled out.

While every system acknowledges the urgency of implementing new guidelines, we still collectively struggle to make significant changes in relatively short periods of time. For example, in a survey of 174 EMS agencies regarding the implementation of the 2005 AHA guidelines, the average time from release to guideline implementation was 416 days.¹

A Save Goes Viral

If you're in EMS and active on Facebook, you've probably seen Wes Rogers.

That's Wes smiling on this month's cover of *EMS World*. We'll excuse you for not recognizing him, though, because when you saw him before (along with millions of online viewers), he wasn't smiling. He was being resuscitated.

Back in June 2009, Rogers, a 53-year-old business owner, collapsed in his Portland, Oregon, office. His coworkers recognized what was going on, called 9-1-1 and began dispatcher-assisted CPR. First responders quickly arrived and took over the resuscitation, and 23 minutes after Wes lost consciousness, he regained a pulse in the field.

Just another cardiac arrest and successful resuscitation, except for one thing: The whole event, from the moment Wes lost consciousness to the moment he was wheeled from the room by rescuers, happened in full view of a security camera.

Upon learning of the video, Mike Verkest, training officer at American Medical Response in Portland, saw an opportunity to use the footage for training. "It doesn't happen very often that stuff gets videotaped," Verkest says. "It was pretty amazing to watch, and as a trainer there were things I wanted the paramedics to take note of."

After obtaining permission from the patient to use the tape for training, Verkest, a self-described "dabbler" in audio and video production, put together highlights from the footage. After the tape aired in front of audiences at conferences, requests began pouring in for an online version. Rogers gave AMR the green light to post the video on Facebook, and within a week more than 750,000 people around the world saw it. Millions more views, likes and shares followed, until the stats became impossible to track.

"It's making such a huge impact," Verkest says. "People tell us, 'This is the chain of survival happening right in front of you—it's a visual of what we've tried to teach people in CPR classes for years.' You have early recognition, 9-1-1 activation, bystander CPR, ACLS intervention and transfer to a specialty resuscitation center. Every time I hear stories about the video, it's the same: This just tells such a cool story about what we do."

For this month's *EMS World* cover photo, Verkest helped bring together

many of the diverse group of people who played a role in Rogers' survival, including representatives from the 9-1-1 dispatch center, Portland Fire, AMR, Portland Adventist Medical Center and others.

"Seeing the whole team there, it really solidifies the relationships we have among all the components of the healthcare system in our community," Verkest says. "We do drills together and work together on STEMI and cardiac care. We know what they do matters, and they know what we do matters."

"It's a really remarkable thing when everything works the way it's supposed to work."

THE SYSTEM BEHIND THE SAVE

1. Survivor, Wes Rogers
2. Kelli Westcott, MD, Portland Adventist Medical Center
3. Flo Wiggins, Paramedic, American Medical Response NW (AMR)
4. Bryan Larson, Critical Care RN, Portland Adventist Medical Center
5. Sarah Straus, RN, Portland Adventist Medical Center
6. Dan Huynh, Firefighter/EMT, Portland Fire & Rescue
7. Anne Hamburg, Emergency Communications Senior Dispatcher, City of Portland
8. Marc Burnham, Operations Manager, AMR
9. James McNulty, ACLS & Simulation Coordinator, Emergency Medicine, Oregon Health & Science University
10. Christopher Swift, Senior Dispatcher (ret.), Bureau of Emergency Communications, Multnomah County
11. Tim Case, Paramedic Supervisor, AMR
12. Eli Goldman-Armstrong, Lieutenant/EMT, Portland Fire & Rescue
13. Morgan Cowger, Paramedic, AMR
14. Steven Johnson, Firefighter/EMT, Portland Fire & Rescue
15. Steve Hunter, Firefighter/EMT, Portland Fire & Rescue
16. Kevin Cummo, Firefighter/Paramedic, Vancouver Fire (WA)
17. Billy Earl, Firefighter/Paramedic, Portland Fire & Rescue

Special thanks to the Medtronic Foundation's HeartRescue Project for making this cover photo possible.

On an individual level, any practitioner involved in resuscitation efforts for any period of time has witnessed the tremendous changes in our approach to treating cardiac arrest. Remember the good old days of the “ABCs”? How about sodium bicarbonate, Isuprel, lidocaine or procainamide? In the more “advanced” systems, remember connecting patients to telemetry monitors, establishing connections with base hospitals and transmitting ventricular fibrillation tracings just to get orders to shock? Remember when automated defibrillators were first placed in the hands of lay rescuers? How about the perception of worsening care because we removed sacred mouth-to-mouth prearrival instructions? Who would have imagined our cardiology colleagues taking unconscious survivors of cardiac arrest to cath labs still comatose?

We’ve learned some important lessons in our quest to provide more effective care for these patients. As with most acute clinical conditions, we now understand there’s both an art and a science to resuscitation. But perhaps the most important lesson we’ve learned in our journey to provide better care for these patients is one that’s not so apparent.

The Problem

Sudden cardiac arrest remains one of the leading killers of Americans, affecting more than 350,000 people each year.² More than 90% of people who experience it don’t survive. In communities that don’t measure their cardiac arrest survival rates, it’s believed survival is much lower. Unfortunately our national survival rate hasn’t significantly changed in more than 30 years.

Modern CPR celebrated its 50th anniversary in 2010. In their landmark *JAMA* article from 1960, authors William Kouwenhoven, Guy Knickerbocker and James Jude documented 14 patients who survived cardiac arrest with application of closed-chest cardiac massage.³ Two years later monophasic waveform defibrillation was first described.⁴ And in 1966 the American Heart Association introduced its first cardiopulmonary

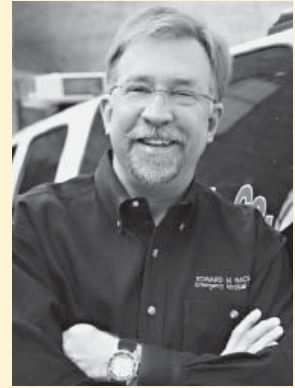
Ed Racht to Present Keynote at EMS World Expo

Ed Racht will be the keynote speaker at the 2012 EMS World Expo, scheduled for October 29–November 2 in New Orleans, LA.

Ed’s presentation, “What Does the Data Tell Us? Rethinking Our Approach to Sudden Cardiac Arrest,” will discuss the HeartRescue Project and show how cardiac arrest is an area where EMS can make a profound difference. Improving survival rates takes commitment, resources and a willingness to work together toward a common goal.

Attend this inspiring and informative session at 10 a.m. on October 31 to find out how your community can save more lives.

For more information, visit EMSWorldExpo.com.



resuscitation guidelines.⁵ Since those early beginnings of contemporary resuscitation efforts, the international resuscitation community has also developed and refined one of the most comprehensive evidence evaluation processes in organized medicine. The 2010 guidelines process involved more than 350 resuscitation experts from 29 countries, who reviewed, analyzed and debated the literature for almost three years.⁶

So here’s the hard part: With so much attention and analysis into this challenging problem, why has our national survival rate remained so stubbornly low? And, even more intriguingly, why is there such significant variation in survival between communities? Consider the 2008 study led by Dr. Graham Nichol that evaluated cardiac arrest survival in 10 communities containing 21.4 million people.⁷ With 20,520 cardiac arrests cumulatively evaluated, survival ranged from 3%–16.3%. What’s the secret? Why can one community realize such positive results while a seemingly equivalent community resuscitates so few?

We have better tools than ever to address this problem. But we need to figure out the best way in each community to use those tools to improve survival. A one-size-fits-all approach can’t be successful given our diversity of communities, rescuers and infrastructure.

The HeartRescue Project

Initiated and supported by the Medtronic Foundation, a passionate group of clinicians, academicians, administrators and researchers gave

birth to the HeartRescue Project (www.heartrescueproject.com). Motivated to dramatically improve SCA survival, this group of individuals and their organizations have partnered to develop integrated community responses to sudden cardiac arrest. The goal of the project is powerful: a 50% increase in survival rates over five years in partner geographies. All the HeartRescue partners are committed to working collaboratively using shared approaches, innovative programs and dissemination of best practices.

The partners represent the states of Arizona, North Carolina, Pennsylvania, Washington, Minnesota, Illinois and the combined national communities served by American Medical Response. Each of the individual partners brings a unique set of skills to the group. They represent a diversity of populations, geographies and challenges. The HeartRescue Project is committed to the belief that sudden cardiac arrest is a very treatable condition. The project has adopted a common set of data elements to measure performance and outcomes, and uses the Cardiac Arrest Registry to Enhance Survival (CARES) database. Participants meet regularly by phone and in person to discuss performance and share innovations, successful approaches and challenges.

The AMR Approach

As a national organization, American Medical Response provides services to more than 2,100 communities across the United States. Based on historical clinical data, its 17,000 care providers will treat

almost 25,000 cardiac arrests a year. This is more than 10% of all the arrests in the United States, and as the caregivers for these individuals, AMR is focused on doing everything it can to maximize their survival. We are committed to sharing our experiences, good and not so good, so others can learn from them, just as we learn from our partners.

One of the most important initial tasks in evaluating a community's opportunity for improvement in resuscitation is identification of all possible participants in the resuscitation sequence. Improving survival requires improvement at all levels, from the bystanders on the street to the cardiologists in the cath labs. Changing just a single part of the system will do only that. To effect substantive changes, all parts and players must work together toward the same goal. Imagine assembling all the individuals responsible for a resuscitation event in your community. The list would be long:

- Bystander
- 9-1-1 communications/dispatch specialist
- First responder (BLS or ALS)
- Ambulance transport (ALS)
- Emergency department staff (physician, nurses, respiratory techs)
- Cardiologists and electrophysiologists
- Cardiac catheterization staff
- Critical care staff (physician, nurses, techs).

Which of the professionals above could you eliminate from the resuscitation and still have the same outcome? Obviously, none. Each of these individuals plays a critical role in ensuring the best possible result.

One of the components of the HeartRescue Project is diving deep into the intricacies of the resuscitation process. In the sequence above one should ask how the bystander was trained and by whom. What protocols do the 9-1-1 communications specialists use, and how do we know they're using their tools effectively? What does the emergency department staff do when notified of incoming post-arrest patients? How and when do the cardiologists get notified? Asking detailed questions about

About the HeartRescue Project

The HeartRescue Project is the vision of—and supported by—the Medtronic Foundation, a grant-making arm of Medtronic Inc.

Medtronic Foundation initiatives seek to improve access to quality healthcare for patients with many diseases, including SCA. Foundation projects range from developing a model for managing chronic conditions like diabetes and heart disease in Rwanda to supporting patient-advocacy organizations worldwide, among many other programs, including the HeartRescue Project.

The project has dedicated more than \$17.5 million in grants for five-year programs conducted by seven partners: the University of Arizona; the University of Minnesota; the University of Pennsylvania; the University of Washington; the University of Illinois; Duke University in North Carolina; and American Medical Response, which responds to 25,000 SCAs annually in the U.S.

The project's goal is both ambitious and straightforward: to increase overall SCA survival to hospital discharge by 50% over five years in its given geographic areas (typically states). This means a 50% increase above the current baseline; a region with a current survival rate of 6%, for example, would aim to increase survival to 9%.

Having such publicly stated measurable goals is a critical part of the HeartRescue approach.

"To have a specific goal, you have

to be focused on data collection, be open to sharing your successes and setbacks, and coordinate your efforts," says Joan Mellor, program manager for the project. "The real challenge is taking what works in a concentrated area and figuring out how to get similar results across a larger region encompassing many different EMS agencies, hospitals, cultures and geographic factors. That's one area where the HeartRescue partners are really demonstrating how important it is to have strong leadership, stakeholder commitment to improving outcomes, and the collaboration it takes to make progress."

Because measuring and reporting results is so critical, HeartRescue partners use a common database for sharing key measurement criteria for SCA, including county- and state-level summaries. "The goal," says Mellor, "is to measure the entire continuum of care and make sure that data gets back to the EMS and hospital stakeholders so they can use it to improve."

The database uses metrics that align closely with the Utstein guidelines as collected through the CDC-affiliated Cardiac Arrest Registry to Enhance Survival (CARES). Other data in the system, such as risk factors, is based on standards used throughout the public health field. The database also incorporates baseline data collection requirements and quality assurance processes to ensure data integrity.

—Jeff Lucia

every step of the process is making sure the "art" of system integration delivers the science we know makes a difference. The strengths and expertise of the individual partners create a unique "resuscitation co-op." Lessons learned can be applied widely to other communities.

All HeartRescue partners have been replicating the "academy" structure so successfully mastered by Dr. Mickey Eisenberg, Ann Doll and others in Seattle (see www.resuscitationacademy.com). Their Resuscitation Academy has been offered multiple times, free of charge. They specialize in teaching strategies for "snatching life from the jaws of death," sharing grassroots principles from some of the greatest minds in resuscitation today.

The Arizona SHARE Program, led by Ben Bobrow, MD, offers an annual CPR Dispatch Academy. This program recognizes the critical role 9-1-1 dispatchers play in SCA survival. It offers instruction to improve dispatcher-assistance programs, focusing on the latest CPR science and techniques dispatchers can use to save lives.

At the University of Pennsylvania, Ben Abella, MD, leads the Hypothermia and Resuscitation Training Institute (HART), an intensive two-day program teaching principles of post-arrest care, including the use of therapeutic hypothermia, cardiac catheterization and internal cardiac defibrillator evaluation.

AMR has been working to develop a leadership academy designed to

help communities identify successful strategies for working together toward improving cardiac arrest survival. Development of a leadership academy recognizes the importance (and frankly the challenges) of the “art” of resuscitation and seeks to develop skills to help individuals forge collaborative relationships focused on a unified goal.

In addition to the academy strategy, AMR has committed to implementing the HeartRescue philosophy by educating 120 clinical leaders responsible for guiding the company’s clinical practices nationwide. Using an electronic grand rounds format, the program hosts nationally known speakers to discuss issues critical to SCA survival, including dispatcher-assisted CPR, on-scene resuscitation and capnography in the EMS world.

A new venture for AMR is the creation of dedicated HeartRescue communities. These are located in the geographies AMR serves, and include other first responder and fire partners, public safety personnel, city government leaders, hospital contacts, community service clubs, business owners and SCA survivors. In 2012 AMR launched 12 of these communities, engaging them to work together to develop strategies for implementing all manner of programs and initiatives that will improve survival. Examples of what they can do together include bystander CPR training, interagency training in pit crew-style resuscitation, and working to ensure that post-arrest care is well-defined, evidence-based and integrated into the system. Communities have been amazingly creative, developing programs that range from traditional bystander training to “CPR in a box” in Bozeman, MT, to “guerilla CPR” on the streets of Santa Barbara, CA.

Additionally, AMR has recognized the significant positive impact of celebration. In the field of medicine, the gold

medal goes to those who save lives. Reuniting rescuers and patients along with their families and friends to celebrate lives saved not only recognizes our successes but motivates our colleagues and communities to do the same. These events remind us of the importance of what we do, our obligation to do it well and the emotional rewards of saving lives.

In keeping with our guiding principle of integrating the art and science of medicine, it’s important to keep a watchful eye on the evidence supporting practices in resuscitation. To this end AMR has introduced our HeartRescue communities

to the Institute for Healthcare Improvement’s collaborative model for

achieving breakthrough improvements. With so much good science at our fingertips, communities know what the best practices are in resuscitation science. The hard part

for all of us now becomes figuring out how to make changes in our practices, and ensuring the changes we make are based on solid evidence and—most important—provide sustained improvement for our patients. In AMR, with leadership from an IHI advisor, we are guiding our practices through the process of applying and evaluating changes in their local settings. Using clinical evidence and best practices, our communities are implementing a series of measurable aims tracked over time and applied in a cycle of change. This promotes learning about how to apply key change ideas in organizations.

Conclusion

So, back to the question about the most important lesson we’ve learned on our journey to provide better care for patients. What’s the common denominator of successful systems and a cornerstone of the HeartRescue Project?

It’s all about the team. Those commu-

nities that truly integrate the entire healthcare system and honestly and openly collaborate to improve outcomes will. No one individual or agency can possibly be as effective as the collective expertise of all. How do we know it works? In 2010 survival of witnessed arrests in AMR practices participating in CARES was 19%. In 2011, it was 33%.

We believe.

Our special thanks and gratitude to the 17,000 men and women of AMR Medicine and our HeartRescue colleagues nationally for the passion and drive to make a difference and for the privilege of spending time with you on the journey. 🌟

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Ed Racht, MD, is chief medical officer for American Medical Response. He has been an EMS physician for 25 years and served as medical director in private, fire-based, third-service, public utility and volunteer EMS systems. Most recently he was vice president of medical affairs/CMO for Piedmont Newnan Hospital in Georgia. He is a clinical associate professor of emergency medicine at UT Southwestern and served for 10 years as chair of the Texas EMS & Trauma Advisory Council.

Lynn White, MS, CCRP, is national director of resuscitation and accountable care at AMR and holds an adjunct professor appointment with The Ohio State University College of Medicine. She was previously the clinical research manager for the Department of Emergency Medicine at The Ohio State University Medical Center, and now serves on the National Association of EMS Physicians’ Board of Directors and as education director for the Medtronic Foundation’s HeartRescue Project.

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- HeartRescue Project Website, www.heartrescueproject.com
- HeartRescue Partners, www.heartrescueproject.com/heartrescue-program/heart-rescue-project-partners/index.htm
- Interactive Simulator for Bystander Awareness, www.heartrescuenow.com
- Cardiac Arrest Registry to Enhance Survival (CARES), www.mycares.net